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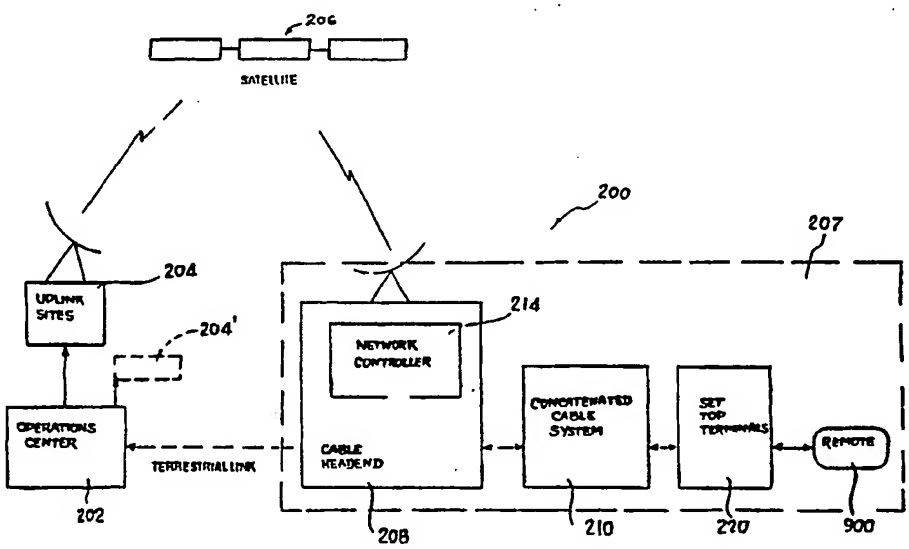

(57) Abstract

An expanded television program delivery system (200) is described which allows viewers to select televison and audio program choices from a series of menus. The primary components of the system include an operations center (202), a digital cable headend (208), and at least one set top terminal (220) having a remote control (900). The system allows for a great number of television signals to be transmitted by using digital compression techniques. A combined signal is transmitted over satellite to a cable headend (208), which may modify the combined signal for changes or additions in programming or menu content. The combined or modified signal is subsequently distributed to individual set top terminals (220) in the cable network (210). Menus are partially stored in a set top terminal (220) in each subscriber's home and may be reprogrammed by signals sent from the operations center (202) or headned (208). Numerous types of menus may be used, incorporating information included within the video/data signal received by the set top terminal (220). A remote control unit (900) with icon buttons allows a subscriber to select programs based upon a series of major menus, submenus, and during program menus. Various data gathering and analysis techniques are used to compile programs watched information that in turn is used in packaging programs, customizing menu selections, targeting advertisements, and maintaining account and billing information.

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CLAIMS

What is claimed is:

1. A television program delivery and program selection system offering a plurality of television programs for selection by a subscriber, using a program control information signal carrying data on packaging of the plurality of the television programs and using computer program instructions stored at each subscriber location to present options on a menu displayed on a television, the system comprising:

an operations center for packaging the plurality of television programs and for generating the program control information signal that includes data on the packaging of the plurality of the television programs;

means for delivering the packaged plurality of the television programs and the program control information signal from the operations center to a subscriber;

means for generating menus with the options for display using the computer program instructions; and,

means for selecting at least one of the delivered packaged television programs for display on the television using the options on the generated menus.

2. The system of claim 1, wherein specific data and information about the television programs is used and wherein the operations center comprises:

means for receiving the plurality of television programs;

input means for receiving the information about each of the plurality of television programs;

database means for storing and supplying the specific data about the television programs;

means for generating the program control information signal based on the information from the input means and the specific data from the database means; and

means for combining the plurality of television programs and the program control information signal for transmission by the delivering means.

3. The system of claim 1, wherein the operations center performs bandwidth allocation and the wherein the operations center comprises processing means for controlling the content of the program control information signal, the processing means comprising:

means for creating program lineups for transmission to subscribers;

means for prioritizing the programs based on a plurality of factors including popularity of the program, its weighted importance and bandwidth available to the viewers to receive the plurality of television programs;

means for allocating bandwidth so that different programs are delivered to different viewers; and

means for creating and changing menus with different programs described for different viewers using the prioritizing means and the allocation means.

4. The system of claim 1, wherein the operations center comprises means for generating a category designation for each television program.

5. The system of claim 1, wherein the selecting means comprises:

a means for choosing one of the options on the generated menus; and

a means for sequencing the computer program instructions based on the chosen option.

6. The system of claim 1 capable of menu generation using the computer program instructions, menu content data, and data carried on the program control information signal including program identification and menu location for each program identification, wherein the generating means comprises:

means for receiving the plurality of television programs and the program control information signal containing the program identification and menu locations;

a microprocessor for executing the computer program instructions for prompting the generation of menus;

menu memory means, connected to the microprocessor, for storing information used to generate menus, the stored information including the program identification and menu locations;

means, connected to the microprocessor, for generating the menus from the stored information in the menu memory means when prompted by the microprocessor; and

means for commanding the microprocessor to prompt the menu generating means to generate the menus for display.

7. The system of claim 6, wherein the commanding means comprises a remote control for remotely commanding the microprocessor.

8. A menu-driven television program selection system offering a plurality of television programs for selection by a subscriber, using a program control information signal carrying programming data on packaging of the plurality of the television programs, also using computer program instructions stored at each of a plurality of subscriber locations to present options on a menu displayed on a television and to receive upstream data signals from subscriber locations at a cable headend, the system comprising:

an operations center for packaging the plurality of television programs and for generating the program control information signal, wherein the packaged plurality of television programs and the program control information signal are transmitted to each cable headend for distribution to the plurality of subscriber locations;

a network controller, located at each cable headend, for receiving and processing the packaged plurality of television programs and the program control information signal and for receiving the upstream data signals from the plurality of subscriber locations;

a means for distributing the packaged plurality of television programs and the program control information signal from the cable headend to each of the plurality of subscriber locations; and

a set top terminal at each of the plurality of subscriber locations for receiving the packaged television programs and the program control information signal from the distributing means, wherein the set top terminal comprises:

a means for selecting one of the packaged plurality of television programs from the displayed menus using the program control information signal and the computer program instructions;

a means for generating the upstream data signals using the computer program instructions; and

a means for transmitting the upstream data signals to the network controller at the cable headend.

9. The system of claim 8, wherein the selecting means comprises:

an electronic memory for storing the computer program instructions;

a processor for sequencing through the computer program instructions and for transforming the program control information signal into the menus to be displayed on the television utilizing the sequenced computer program instructions; and

a subscriber interface for choosing one of the options from the displayed menus, wherein the chosen options effect the sequencing of the computer program instructions.

10. The system of claim 8, wherein the packaged television programs are grouped by program category and wherein the means for selecting comprises means for choosing a program category with each category being accessible by choosing its corresponding option from the displayed menu.

11. The system of claim 8, wherein the displayed menus are multi-leveled and wherein the means for selecting comprises a means for displaying multi-leveled menus so that the options chosen from the user interface may be used to display another menu.

12. The system of claim 8 capable of processing programs watched information, wherein the network controller comprises means for processing the upstream data signals that include the programs watched information.

13. The system of claim 8 capable of providing interactive communications between the cable headend and the plurality of subscriber locations, wherein the network controller comprises means for processing the upstream data signals that include the interactive communications.

14. A menu-driven cable television selection system offering a plurality of television programs for selection by a subscriber, using a program control information signal carrying programming data on packaging of the plurality of the television programs, also using computer program instructions at each of a plurality of subscriber locations to present options on a menu displayed on a television and to compile programs watched data that is subsequently gathered at each cable headend, the system comprising:

an operations center for packaging the plurality of television programs and for generating the program control information signal, wherein the packaged plurality of television programs and the program control information signal are transmitted to each cable headend for distribution to the plurality of subscriber locations;

a means, located at each cable headend, for distributing the packaged plurality of television programs and the program control information signal to the plurality of subscriber locations;

a means, connected to the distributing means, for monitoring and controlling each set top terminal at each of the plurality of subscriber locations;

a means, located at the plurality of subscriber locations, for receiving the packaged plurality of television programs and the program control information signal from each cable headend;

a means, connected to the receiving means, for storing computer program instructions;

a means, connected to the storing means, for sequencing the stored computer program instructions to generate and display the menus, wherein the sequencing means uses the programming data carried by the program control information signal;

a subscriber interface for choosing one of the options on the menus, wherein the chosen option effects the sequencing of the stored computer program instructions by the sequencing means;

a means for compiling the programs watched data using the chosen options that correspond to the

selecting of one of the packaged plurality of television programs offered;

a means, at each of the subscriber locations, for reporting the compiled programs watched data to each cable headend; and

a means, located at each cable headend and connected to the monitoring and controlling means, for gathering the compiled programs watched data reported from each of the plurality of subscriber locations.

15. The system of claim 14 capable of modifying the data on the program control information signal using network control data stored at the cable headend to produce a modified program control information signal, wherein the monitoring and controlling means comprises:

a means for storing the network control data;

a means for interpreting data from the program control information signal to determine the program identification and menu locations;

a means for modifying the interpreted data based on the stored network control data; and

a means for creating the modified program control information signal based on the modified interpreted data.

16. The system of claim 14 capable of polling each subscriber location for the compiled programs watched data, wherein the gathering means comprises:

a means for extracting data from the program control information signal to determine the program identification and menu locations;

a means for creating a polling request message that requests the reporting means to send the programs watched information to the cable headend; and

a means for processing the reported programs watched information.

17. The system of claim 16, wherein the processing means comprises:

a means for storing the reported programs watched information to produce stored programs watched data;

a means for accessing the stored programs watched data;

a means for determining the programs most frequently watched based on the stored programs watched data;

a means for correlating advertisements that correspond to those programs most frequently watched to produce targeted advertisements;

a means for sending the targeted advertisements to the distributing means for packaging and distribution to the plurality of subscriber locations.

18. The system of claim 16 capable of generating and maintaining account and billing information for each subscriber, wherein the processing means comprises:

a means for storing the reported programs watched information to produce stored programs watched data;

a means for accessing the stored programs watched data;

a means for producing the account and billing information based on the stored programs watched data.

19. A digitally compressed program delivery system to provide subscribers with menu selection of a plurality of television programs using a plurality of analog program signals and a program control information signal received at each cable headend for further transmission, each cable headend transmitting to each subscriber a control information stream and programming signals carrying the plurality of the television programs, the menus generated and displayed using the control information stream and menu templates stored at each subscriber location, the system comprising:

means for digitally compressing a plurality of analog program signals to produce digitally compressed signals;

means for generating the program control information signal;

means for packaging each of the digitally compressed signals and the program control information signal to produce a packaged signal;

means for transmitting the packaged signal to each cable headend for processing;

means for processing the packaged signal to produce the control information stream and the programming signals;

means for distributing the control information stream and the programming signals to each subscriber location for generation and display of the menus using the stored menu templates and the control information stream; and

subscriber interface means for selection of any one of the plurality of television programs using one or more of the generated and displayed menus.

20. The compressed program delivery system of claim 19 capable of using digital program signals, wherein the means for digitally compressing comprises means to compress digital program signals so that the digitally compressed signals are produced from the plurality of analog program signals and the digital program signals.

21. The compressed program delivery system of claim 19 capable extracting control information and selecting individual programs from the packaged signal, wherein the processing means comprises:

a means for receiving the packaged signal;

a means for demultiplexing the packaged signal into the control information and the individual programs;

a means for selecting some of the individual programs;

a means for combining the selected individual programs to produce the programming signals; and

a means for modifying the control information to produce the control information stream.

22. The compressed program delivery system of claim 21 capable of distributing regional programs, wherein the combining means comprises means for adding the regional programs to the selected individual programs to produce the programming signals.

23. The compressed program delivery system of claim 19 capable of delivering analog signals to each subscriber location, wherein the distributing means comprises a digital-to-analog conversion means for converting the programming signals to analog signals for distribution to each subscriber location.

24. The system of claim 19 capable of processing regional programming information, wherein the processing means comprises a network controller for modifying the program control information to include regional programming information, wherein the modified program control information is used to produce the control information stream.

25. A method for offering a plurality of television programs for selection by a subscriber, using a program control information signal carrying data on packaging of the plurality of the television programs and using computer program instructions stored at each subscriber location to present options on a menu displayed on a television, the method comprising the steps of:

packaging the plurality of television programs;

generating the program control information signal that includes data on the packaging of the plurality of the television programs;

delivering the packaged plurality of the television programs and the program control information signal to a subscriber;

generating menus with the options for display menus using the computer program instructions; and,

selecting at least one of the delivered packaged television programs for display on the television using the options on the generated menus.

26. A method for offering a plurality of television programs for selection by a subscriber, using a program control information signal carrying programming data on packaging of the plurality of the television programs, also using computer program instructions at each of a plurality of subscriber locations to present options on a menu displayed on a television and to compile programs watched data that is subsequently gathered at each cable headend, the method comprising the steps of:

packaging the plurality of television programs;

generating the program control information signal, wherein the packaged plurality of television programs and the program control information signal are transmitted to each cable headend for distribution to the plurality of subscriber locations;

distributing the packaged plurality of television programs and the program control information signal to the plurality of subscriber locations;

monitoring and controlling each set top terminal at each of the plurality of subscriber locations;

receiving the packaged plurality of television programs and the program control information signal from each cable headend;

storing computer program instructions;

sequencing the stored computer program instructions to generate and display the menus, wherein the sequencing uses the programming data carried by the program control information signal;

choosing one of the options on the menus, wherein the chosen option effects the sequencing of the stored computer program instructions by the sequencing step;

compiling the programs watched data using the chosen options that correspond to the selecting of one of the packaged plurality of television programs offered;

reporting the compiled programs watched data to each cable headend; and

gathering the compiled programs watched data reported from each of the plurality of subscriber locations.